

PHYTOTOXICOLOGY
ASSESSMENT SURVEY
OF CONTAMINANTS IN SOIL ON
FORMER WILCO CANADA LTD.,
PROPERTY AND VICINITY,
LONDON - OCTOBER 10, 1986

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Ministry
of the
Environment

E. PICHÉ, Director
Air Resources Branch

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Phytotoxicology Assessment Survey of Contaminants in
Soil on Former Wilco Canada Ltd. Property and
Vicinity, London - October 10, 1986

Phytotoxicology Section
Air Resources Branch

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ABSTRACT

Concentrations of lead and Zinc in excess of the Phytotoxicology Section recommended industrial cleanup (decommissioning) guidelines were measured in surface soil collected at two locations near the rear of the former Wilco Canada Lt. property. Although no off-Property locations were found to have excessive soils concentrations of contaminants, the survey results indicated that some movement of lead and zinc had occurred along a drainage depression leading from the rear of the former Wilco property to Pottersburg Creek.

Résumé

Les concentrations de plomb et de zinc, mesurées dans des échantillons de sol prélevés en surface à deux endroits vers l'arrière de l'ancienne propriété de la société Wilco Canada Ltd., dépassent les lignes directrices de la Section de phytotoxicologie recommandant le nettoyage industriel (ou la fermeture). On n'a constaté aucune concentration de polluants excessive dans le sol en dehors de la propriété à l'étude; toutefois, les résultats font apparaître que le plomb et le zinc se sont quelque peu déplacés le long de la rigole de drainage allant de l'arrière de l'ancienne propriété de la société Wilco jusqu'au ruisseau Pottersburg.

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INTRODUCTION

In August 1986, the Phytotoxicology Section was requested by Southwestern Region MOE to undertake a survey of metallic contaminants in soil on the former Wilco Canada Ltd. property in London. Previous Phytotoxicology surveys conducted in 1974 and 1982 in the vicinity of Wilco, but off property, did not reveal any pattern of lead contamination of soil or vegetation attributable to emissions from the company.

According to Southwestern Region MOE, operations at the Wilco facility had ceased for a time and had recently resumed under a different name (GRW Industries). The Phytotoxicology survey was requested in order to determine if the operations of Wilco Canada had resulted in an impairment of the soil quality sufficient to pose an environmental hazard, with particular regard to nearby Pottersburg Creek.

METHODS

On October 10, 1986, members of the Phytotoxicology Section visited the former Wilco Canada Ltd. property and collected surface (0-5 cm) and subsurface (5-10 cm) soil samples from 9 locations (Figure 1).

The samples were transported to Toronto where they were processed in the Phytotoxicology laboratory and submitted to the MOE Resources Road laboratory for analysis of vanadium (V), zinc (Zn), iron (Fe), manganese (Mn), cadmium (Cd), cobalt (Co), chromium (Cr), copper (Cu), molybdenum (Mo), nickel (Ni) and lead (Pb). Additionally, pH of the 0-5 cm soil samples was determined in the Phytotoxicology laboratory.

RESULTS AND DISCUSSION

The analytical results are shown in the attached table. Of greatest concern are the elevated lead concentrations at Station 3, located in a slight depression immediately behind the former Wilco building. The surface soil (0-5 cm) lead concentration of 37000 ug/g is 36 times higher than the Phytotoxicology Section recommended industrial clean-up (decommissioning) guideline of 1000 ug/g Pb. Furthermore, surface lead concentrations at Station 4, located approximately midway along the drainage depression leading to Pottersburg Creek, and at Station 5, located at the confluence of the drainage depression and the creek, also were elevated relative to levels generally found elsewhere in the area (see Figure 2). These results indicate that some movement of contaminants (lead) had occurred from the former Wilco property toward the creek.

The surface soil lead level at Station 1, at the northwest corner of the former Wilco property, was 1200 ug/g, slightly in excess of the 1000 ug/g recommended industrial clean-up guideline. However, the lead concentration on the nearby creek bank was low.

Excessive concentrations of zinc and slightly elevated levels of chromium also were present at Stations 1 and 3 (see table). Zinc concentrations at Stations 4 and 5 were higher than levels found elsewhere in the area. Manganese concentrations at Stations 4 and 5 were marginally above normal, but are in themselves no cause for concern.

In all of the above instances of elevated or excessive soil levels of contaminants, concentrations in the surface 0-5 cm profile were higher than in the subsurface 5-10 cm profile, indicating that the contamination originated as surface deposition.

The results of the pH analyses (see table) indicate that soils in the area are alkaline. The solubility (availability) of most metals (including lead and zinc) is lower in alkaline soils than in acid soils. However, molybdenum, selenium and hexavalent chromium are more

soluble under alkaline than acid conditions. Because soil concentrations of Cr and Mo in the vicinity of the former Wilco facility are relatively low, the moderate alkalinity of the soil should not be of concern.

SUMMARY

Concentrations of lead and zinc in excess of the Phytotoxicology Section recommended industrial clean-up (decommissioning) guidelines were measured in surface soil collected at two locations near the rear of the former Wilco Canada Ltd. property. Although no off-property locations were found to have excessive soil concentrations of contaminants, the survey results indicated that some movement of lead and zinc had occurred along a drainage depression leading from the rear of the former Wilco property to Pottersburg Creek.

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Table - Contaminant concentrations (ug/g, dry weight) in soil samples collected from former Wilco Canada Ltd. property and vicinity, London, Ontario - October 10, 1986

Sampling Stn. No. and Depth	Contaminant											Soil pH
	V	Zn	Fe	Mn	Cd	Co	Cr	Cu	Mo	Ni	Pb	
1 - 0 to 5 cm	30	<u>930</u>	19000	500	0.7	10	<u>58</u>	29	<1	18	<u>1200</u>	8.5
1 - 5 to 10 cm	30	260	19000	500	0.5	9	29	20	<1	16	160	
2 - 0 to 5 cm	30	160	17000	450	0.4	8	28	19	<1	15	60	8.5
2 - 5 to 10 cm	30	98	17000	450	0.3	8	27	18	<1	14	34	
3 - 0 to 5 cm	27	<u>7500</u>	22000	460	1.8	12	<u>110</u>	71	1	24	<u>37000</u>	8.3
3 - 5 to 10 cm	35	<u>1400</u>	23000	510	1.1	11	72	37	<1	29	<u>11000</u>	
4 - 0 to 5 cm	29	380	17000	<u>730</u>	0.6	9	29	21	<1	16	490	8.3
4 - 5 to 10 cm	30	250	18000	520	0.4	9	28	21	<1	16	89	
5 - 0 to 5 cm*	31	475	18500	<u>855</u>	0.9	9	37	32	<1	17	485	8.4
5 - 5 to 10 cm*	32	410	19000	825	0.8	9	42	30	<1	16	430	
6 - 0 to 5 cm	36	74	20000	510	0.5	9	28	19	<1	16	51	8.6
6 - 5 to 10 cm	34	50	20000	490	0.4	9	27	19	<1	17	19	
7 - 0 to 5 cm	31	54	17000	370	0.4	9	24	17	<1	13	27	7.4
7 - 5 to 10 cm	29	53	17000	370	0.4	9	24	15	<1	13	25	
8 - 0 to 5 cm*	34	145	19000	635	0.8	9	30	26	<1	14	150	8.3
8 - 5 to 10 cm*	30	120	17000	525	0.6	8	26	22	<1	13	115	
9 - 0 to 5 cm	25	72	14000	620	0.6	7	25	17	<1	11	33	8.4
9 - 5 to 10 cm	27	57	14000	580	0.7	7	24	17	<1	10	16	
U.L.N.**	70	500	35000	700	4	25	50	100	3	60	500	-
R.C.G.***	250	800	-	-	8	100	1000	300	40	200	1000	6-8 ⁺

* Results are averages of duplicate samples.

** "Upper limit of normal" for urban soil (0-5 cm) established by Phytotoxicology Section (exceedances are in bold type).

*** Recommended soil clean-up guideline for decommissioning for industrial redevelopment (exceedances are underlined).

⁺ pH range to which clean-up guidelines apply.

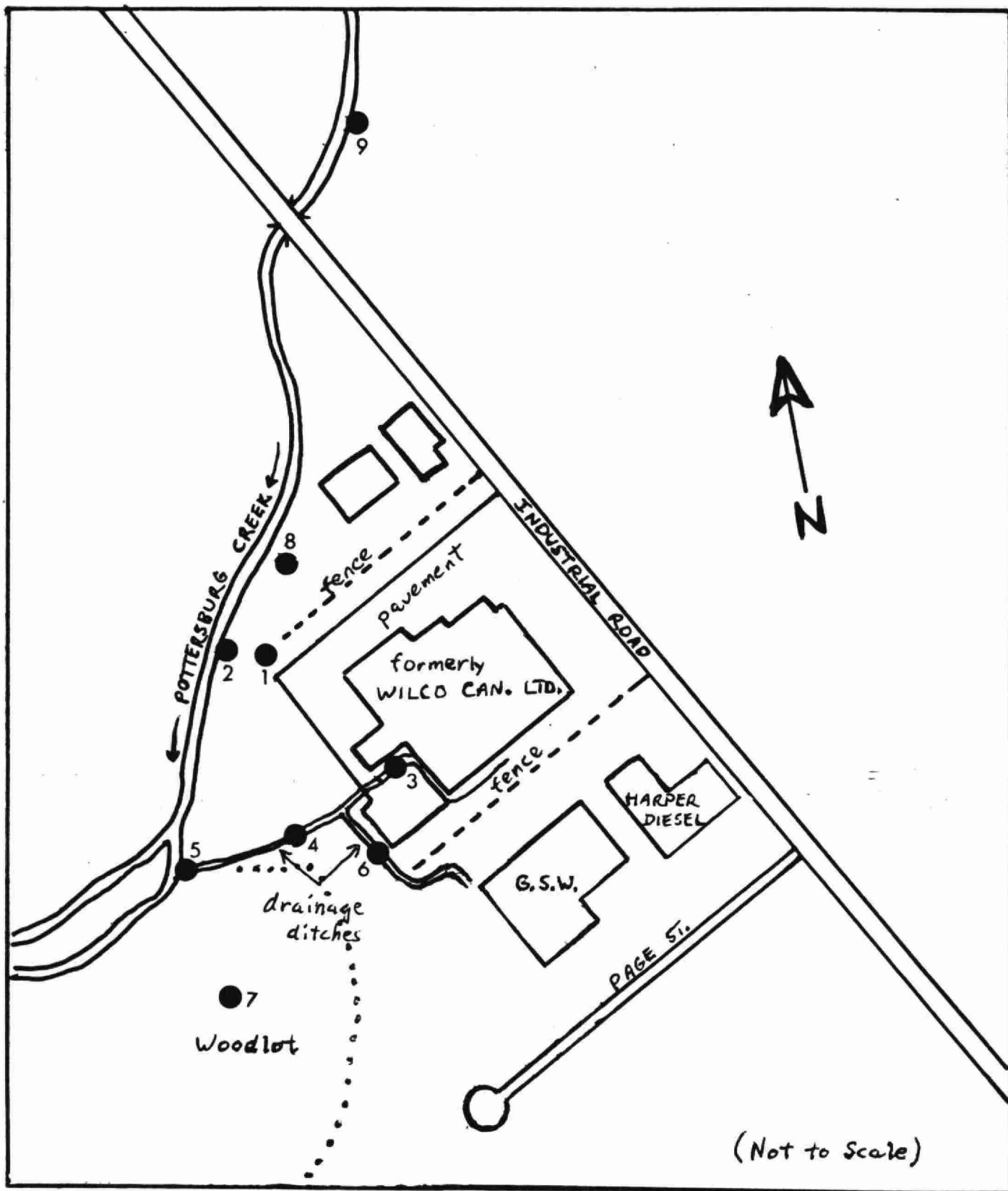


Figure 1 - Locations of soil sampling stations
on and in the vicinity of the former
Wilco Can. Ltd. property, London
- Oct. 10, 1986.

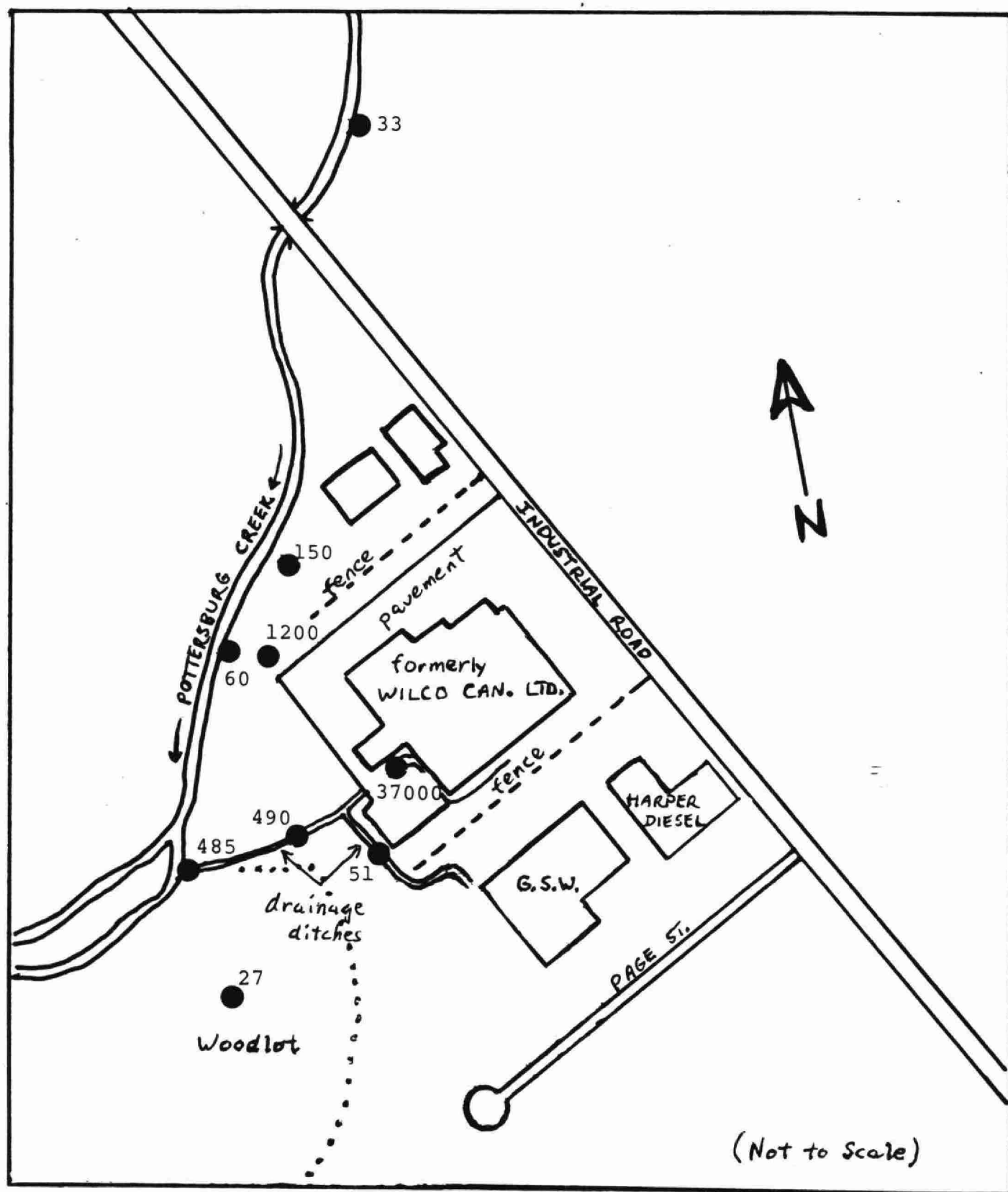


Figure 2 - Lead concentrations (ug/g, dry wt.)
in surface soil (0 - 5 cm) on and in
the vicinity of the former Wilco Can.
Ltd. property, London - Oct. 10, 1986.



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